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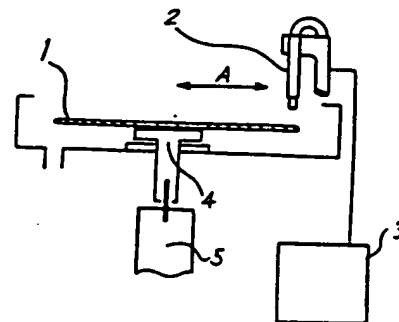
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**(54) MANUFACTURING APPARATUS FOR SEMICONDUCTOR DEVICE**

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**PURPOSE:** To make the progress of a chemical reaction uniform, and to improve the accuracy of finishing of a semiconductor substrate by moving a chemical dropping port shifted on the substrate at nonuniform velocity at arbitrarily set speed and acceleration.

**CONSTITUTION:** A semiconductor substrate 1 is sucked to a sucking section 4, and turned by a power section 5. A chemical dropping port 2 is moved rectilinearly in the direction A (the radial direction). The chemical dropping port 2 can be controlled at arbitrary speed and acceleration and shifted at nonuniform velocity by a speed control unit 3 in a moving section. Accordingly, the quantity of chemicals dropped can be made uniform in the outer circumferential section and central section of the surface of the semiconductor substrate 1, and dispersion in a substrate surface in the progress of a chemical reaction is reduced, thus improving the accuracy of finishing of the semiconductor substrate.



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⑰ 発明の名称 半導体装置の製造装置

⑱ 特 願 平1-157728

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## 明 細 書

## 1. 発明の名称

半導体装置の製造装置

## 2. 特許請求の範囲

半導体基板上を移動する薬液滴下口より薬液を滴下し、当該基板を回転させて薬液を広げ、当該基板の加工を行う半導体装置の製造装置において、前記薬液滴下口の移動速度を制御する手段を有することを特徴とする半導体装置の製造装置。

## 3. 発明の詳細な説明

〔産業上の利用分野〕

本発明は半導体装置の製造装置に関し、特に半導体基板上に薬液を滴下し、薬液との化学反応によって半導体基板を加工する半導体装置の製造装置に関する。

〔従来の技術〕

従来、この種の半導体装置の製造装置は、半導

体基板を回転させ、当該基板上で薬液滴下口を半径方向に移動させて薬液を滴下する際、薬液滴下口は移動区間を等速で移動する構造となっていた。  
〔発明が解決しようとする課題〕

上述した従来の半導体装置の製造装置は、薬液滴下口が移動区間を等速で移動する構造となっているので、回転する半導体基板の外周部と中央部では、滴下口の移動中当該基板面内で薬液の広がる量が異なり、当該基板表面と薬液との化学反応の進行において均一性を害し、当該基板の加工精度を低下させるという欠点がある。

〔課題を解決するための手段〕

本発明は、半導体基板上を移動する薬液滴下口より薬液を滴下し、当該基板を回転させて薬液を広げ、当該基板の加工を行う半導体装置の製造装置において、前記薬液滴下口の移動速度を制御する手段を有する半導体装置の製造装置である。

〔実施例〕

次に本発明について図面を参照して説明する。

第1図は本発明の第1の実施例の断面図である。

半導体基板1は吸着部4に吸着され、動力部5により回転する。薬液滴下口2はA方向（半径方向）に直線移動するが、移動区間内で速度制御ユニット3により、任意に速度及び加速度の制御が可能で非等速に移動する。

これにより、半導体基板1の表面の外周部と中央部とで薬液の滴下される量が均一化でき、化学反応の進行における当該基板面内でのばらつきが低減し、半導体基板の加工精度を向上させることができる。

第2図は本発明の第2の実施例の断面図である。この実施例では、薬液滴下口2及び6という様に複数の滴下口を設け、それぞれA、B方向に移動できる。そして、おのおのの薬液滴下口2及び6に接続される速度制御ユニット3及び7で移動速度を制御し、第1の実施例と同様の効果を得られる事はもちろん、薬液滴下時間の短縮を図れるという利点を有する。

〔発明の効果〕

以上説明したように本発明は、回転している半

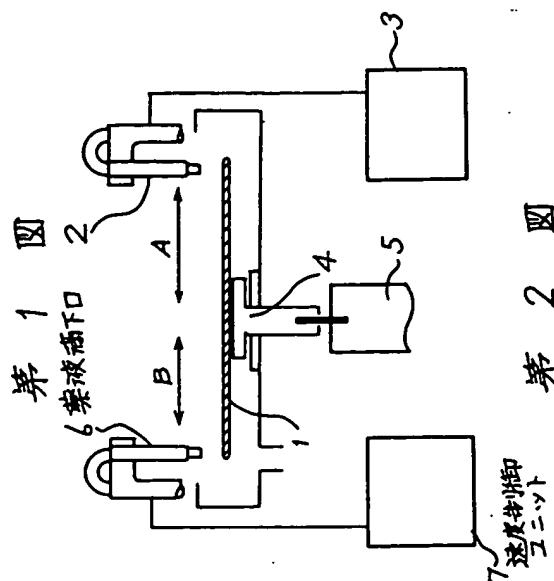
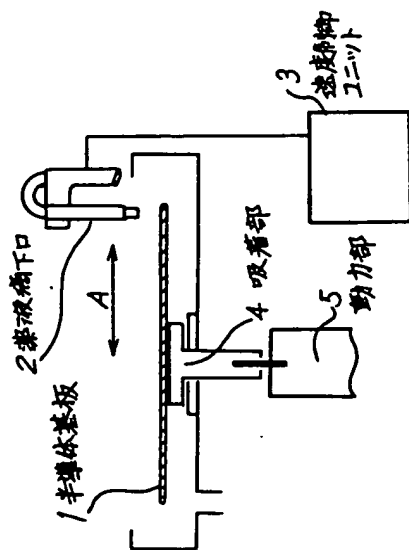
導体基板上を移動する薬液滴下口が、任意に設定した速度及び加速度で非等速に移動することにより、半導体基板表面と薬液との化学反応の進行を均一化でき、当該基板の加工精度を向上できる効果がある。

#### 4. 図面の簡単な説明

第1図は本発明の第1の実施例を示す断面図、第2図は本発明の第2の実施例を示す断面図である。

1……半導体基板、2、6……薬液滴下口、3、7……速度制御ユニット、4……吸着部、5……動力部。

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Japanese Kokai Patent Application No. Hei 3[1991]-22428

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MANUFACTURING APPARATUS FOR SEMICONDUCTOR DEVICE

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Claim

Manufacturing apparatus for semiconductor devices wherein a chemical is dropped from a chemical dropping port that moves on a semiconductor substrate, the said substrate is turned to disperse the chemical, and the said substrate is processed, characterized by the fact that it has a means to control the moving speed of the aforementioned chemical dropping port.

Detailed explanation of the invention

Industrial application field

The present invention pertains to a manufacturing apparatus for semiconductor devices. In particular, it pertains to a manufacturing apparatus for semiconductor devices wherein a chemical is dropped on a semiconductor substrate, and the semiconductor substrate is processed by means of a chemical reaction.

#### Prior art

Conventionally, this type of manufacturing apparatus for semiconductor devices has the following structure. When the semiconductor substrate is turned and the chemical is dropped by moving the chemical dropping port in the direction of the radius on the said substrate, the chemical dropping port moves at constant speed in the moving zone.

#### Problem to be solved by the invention

As the aforementioned conventional manufacturing apparatus for semiconductor devices has a structure wherein the chemical dropping port moves at constant speed in the moving zone, the quantities of the chemical being dispersed on the surface of the said substrate while the dropping port is moving are different in the outer circumferential section and in the central section. Thus, the uniformity of the progress of chemical reaction between the surface of the said substrate and the chemical is impaired. Thus, there is a problem that the processing accuracy of the said substrate is lowered.

#### Means to solve the problem

The present invention is a manufacturing apparatus for semiconductor devices wherein a chemical is dropped from a chemical dropping port that moves on a semiconductor substrate, the said substrate is turned to disperse the chemical, and the said substrate is processed, and wherein a means to control the



moving speed of the aforementioned chemical dropping port is provided.

#### Application examples

Next, the present invention will be explained in reference to the figures.

Figure 1 illustrates a cross-sectional view of the first application example of the present invention. The semiconductor substrate (1) is pulled to the suction component (4), and is turned by the power source (5). The chemical dropping port (2) linearly moves in the direction A (radial direction). In the moving zone, the speed and the acceleration of the port can be controlled in any way by the speed control unit (3). Thus, the port moves at nonuniform speed.

In this manner, the quantity of the chemical that is dropped on the outer circumferential section and the central section of the surface of the semiconductor substrate (1) can be made uniform. Thus, variation in the progress of chemical reaction on the said substrate surface can be reduced, and the processing accuracy of the semiconductor substrate can be improved.

Figure 2 illustrates a cross-sectional view of the second application example of the present invention. In this application example, more than one chemical dropping port such as chemical dropping ports (2) and (6) are provided, and they can be moved respectively in the directions of A and B. The moving speeds are then controlled by the speed control units (3) and (7) that are respectively connected to the chemical dropping ports (2) and (6). The same effect can be obtained as that of the first

application example. Additionally, this example has the advantage of shortening the chemical dropping time.

#### Effect of the invention

As explained above, in the present invention, the chemical dropping port that moves on a semiconductor substrate that is turning moves at nonuniform speed and acceleration is arbitrarily set. In this manner, the progress of chemical reaction between the surface of the semiconductor substrate and the chemical can be made uniform. As a result, the processing accuracy of the said substrate can be effectively improved.

#### Brief description of the figures

Figure 1 is a cross-sectional view that illustrates the first application example of the present invention. Figure 2 is a cross-sectional view that illustrates the second application example of the present invention.

[Key:]      1      Semiconductor substrate  
             2, 6 Chemical dropping port  
             3, 7 Speed control unit  
             4      Suction component  
             5      Power source

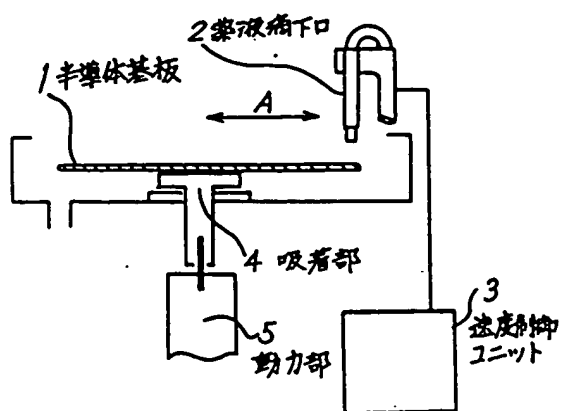


Figure 1

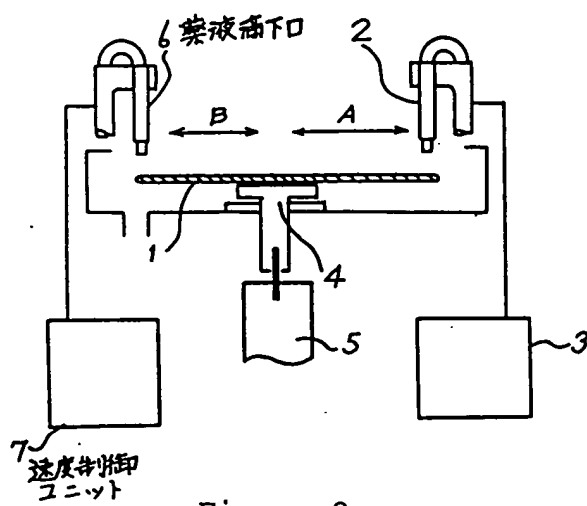


Figure 2